

2.4 Drawing Data Levels

A. Standardization of a Level Convention for Design Information

The use and application of the leveling convention defined in this section should be uniformly observed for the following reasons:

1. Work Transfer

To efficiently transfer work between functional units, CADD drawings must conform to a uniform leveling convention. If the same leveling convention is used, considerable time and effort is saved in obtaining only the desired information.

2. Multi-Operators

It is not uncommon for more than one person to work on the same drawing file. For the drawing file to be effectively and efficiently used by all, each operator must conform to the same uniform leveling convention.

3. Drawing Life

At Caltrans, drawings are active for several years and often longer. As-builts stored as MicroStation dgn files can be quickly used to start a new project or preliminary study. How the data is entered today (i.e., what levels are used for what kinds of data) must be readily apparent for a long period, often after the original operators are no longer available. This problem is minimized with a uniform leveling convention.

B. Highway/Landscape Leveling Convention

1. General Content of Highway/Landscape levels is as follows:

Level 1	Control Data
Levels 2-8, 11 & 12	Basic topographic map data
Levels 9 & 10	Sheet formats
Levels 13 – 28, 30	Alignments and Construction Details
Levels 31 - 33	Right of Way data
Levels 29, 34 - 59	Data for specific type of plan sheet
Level 60	Non-geographical drawing data
Levels 61 & 62	HQ & As-Built changes
Level 63	Engineer Seal & Signature

2. Summary of Highway/Landscape levels is as follows:

Level	Content
1	Control (Includes Survey Monuments)
2	Existing Manmade Features
3	Existing Roadway Features
4	Existing Vegetation and Natural Features
5	Existing Utilities and Utility Facilities
6	Existing Hydrographic Features
7	Relief Features - Contours
8	Spot Elevations and Contour Annotations
9	Profile Grid
10	Border Sheets
11	Break Line, Terrain Features for 3D & Profile Grid
12	Coordinate Grid Ticks and Labels and Construction Staking Survey Control Data
13	Ramp, Over and Under Crossing Alignment Data
14	Ramp, Over and Under Crossing Annotation
15	Mainline Alignment Data
16	Mainline Alignment Annotation
17	Frontage Road Alignment Data
18	Frontage Road Alignment Annotation
19	Undefined
20	Pavement Edges
21	Curbs, Gutters, Dikes, Overside & Edge drains
22	Miscellaneous Construction Features
23	Layout Notes
24	Obliteration, AC Resurfacing & Cold Planing
25	Temporary Road Connections and Alignments, also for Railroad, Bike & Pedestrian Paths & Creek Alignments
26	Undefined
27	Undefined
28	Undefined
29	Existing Irrigation - Includes Annotation
30	Cut and Fill Data
31	Existing Right of Way Boundaries
32	New Right of Way, Fences & ESA's
33	Right of Way Text & Annotation
34	Temporary Water Pollution Control
35	Permanent Erosion Control
36	Drainage
37	Drainage Annotation

Level	Content
38	Sanitary Sewer
39	Sanitary Sewer Annotation
40	New Utilities - Includes Annotation
41	Contour Grading
42	Pavement Elevations
43	Pavement Markers and Striping
44	Pavement Markers and Striping Annotation
45	Signing
46	Construction Area Signing
47	Electrical
48	Electrical Annotation
49	Planting and Landscaping
50	New Irrigation - Includes Annotation
51	Stage 1 Construction and Temporary Traffic Facilities
52	Stage 1 Construction and Temporary Traffic Facilities Annotation
53	Stage 2 Construction and Temporary Traffic Facilities
54	Stage 2 Construction and Temporary Traffic Facilities Annotation
55	Stage 3 Construction and Temporary Traffic Facilities
56	Stage 3 Construction and Temporary Traffic Facilities Annotation
57	Undefined
58	Sound Walls & Retaining Walls
59	Sound Walls & Retaining Walls Annotation
60*	Non-geographical Drawing Data*
61	Headquarters Changes
62	As-Built Changes
63	Engineer Seal & Signature

(*) Key Map; Title Sheet; Profiles; Typical Cross Sections; Superelevation Diagrams, Construction Details and Quantity of Summaries should reside on Level 60.

Undefined levels may be used for information that has not been assigned to a specific level.

When creating additional base maps (i.e.: for Stage Construction or for plan sheets other than Layouts), level 11 (which is a drop out level) can be used to move some of the proposed design information to. This would facilitate showing already constructed design information as dropped out for a later stage within the constructing or sequencing of a project.

3. The following table identifies each level, it's associated color and the specific information belonging on each level for Highway/Landscape Construction projects.

LEVEL NO.	COLOR/ NAME & NUMBER	TITLE	DESCRIPTION/CONTENT
1	Violet/5	Control	All photo control data, and topographic map survey information. Also includes district-added control information.
2	Yellow/4	Existing Manmade Features	All existing man-made features not otherwise included in any other level, includes all buildings.
3	Yellow/4	Existing Roadway Features	Edges of existing surfaced areas accessible to vehicles, bicycles or pedestrians within the Existing Roadway limits. Examples of Roadway Features are traveled way, edge of pavement lane striping and dikes. The limits of the Existing Roadway are the outside edges of the existing surfaced shoulders, curbs or dikes. Roadway includes all public highways, streets, surfaced and unsurfaced roads, and railroads if the railroads are being improved as part of the project. Roadway does NOT include private roads such as driveways, ranch roads, parking lot streets and roads and streets within large commercial establishments. Railroads (not to be improved), private roads, guard railing, median barriers, right of way fences, existing sidewalks contiguous to the outside curbs are to be placed on Level 2.
4	Green/2	Existing Vegetation and Natural Features	All natural vegetation, existing highway plantings, orchards, vineyards, marshes, and miscellaneous natural features such as rock outcrops, slides, etc.
5	Orange/6 (Note 1)	Existing Utilities and Utility Features	All existing underground and aboveground utility-type facilities (including signals, power and telephone poles and transmission poles for utility, railroad, highway, street, and private improvements.) All existing drainage structures including culverts and headwalls, excluding substantial structures such as buildings. Also, includes district-added underground utilities.
6	Blue/1	Existing Hydro-graphic Features	All lakes, rivers, streams, natural channels, swamps, and standing water.
7	Brown/7	Relief Features Contour Lines Only	Contours (lines only) of the original terrain.
8	Brown/7	Spot Elevations and Contour Elevation Annotation	Spot elevations and contour elevation annotation.
9	Red/3	Profile Grid	Dropout grid for full profile and combination plan and profile standard sheets (red grid lines).
10	White/0	Border Sheets	Standard Border Sheets, (22" x 34" when plotted) with trim lines, registration seal, signature blocks, District-County-Route-Post Mile block, plan sheet name, match lines & north arrow (Information associated with the border).

LEVEL NO.	COLOR/ NAME & NUMBER	TITLE	DESCRIPTION/CONTENT
11	White/0	Terrain features for dtm, profile grid and dropout level for base maps	Terrain features that define the ground surface for a 3D digital terrain model. Green grid lines for profile sheets. Can be used for dropping out information on non-dropout levels for possible additional base maps.
12	Violet/5	Coordinate Grid	Coordinate grid ticks and labels. Construction Staking Survey Control Data.
13	White/0	Ramp, Over & Under Crossing Alignment	Ramp, Over Crossing & Under Crossing alignment(s), includes station line and tick marks.
14	White/0	Ramp, Over & Under Crossing Annotation	Ramp, Over & Under Crossing annotation, includes Route designation, alignment bearing and station number.
15	White/0	Mainline Alignment	Mainline Alignment(s) for the main roadways, includes station line and tick marks.
16	White/0	Mainline Alignment Annotation	Mainline Alignment Annotation, includes Route designation, alignment bearing and station number.
17	White/0	Frontage Road Alignment	Frontage Road Alignment(s), includes station line and tick marks.
18	White/0	Frontage Road Alignment Annotation	Frontage Road Annotation, includes Route designation, alignment bearing and station number.
19	White/0	Undefined	
20	White/0	Pavement Edges	All lines necessary to depict the edges of pavement to be constructed, including traveled way, shoulders, road approaches and driveways.
21	White/0	Curbs, Gutters, Dikes and Drains	All drawing information required to depict curbs, gutters, dikes, overside & edge drains, includes annotation.
22	White/0	Miscellaneous Construction Features	All drawing information required to depict the construction shown on the layout plan, not specifically on other levels; e.g., new railings & barriers, crash cushions, sidewalks, bridge structures, miscellaneous paved areas.
23	White/0	Layout Notes	All notes, dimensions, and labeling required to describe the construction shown on the layout plan sheets, (except annotation specifically included on other levels) includes related lines and symbols such as leader lines, arrows, arrowheads, curve table, and legend.
24	Red/3	Obliteration and AC Resurfacing	All drawing information required to depict planing, grinding, obliterating and resurfacing of roadways.
25	Red/3	Temporary Road Connections and Alignments	All drawing information required to describe temporary road connections alignments, includes station line, tick marks and annotation. Also alignments for Railroad, Bike Paths, Creeks & Pedestrian Paths.
26	White/0	Undefined	
27	White/0	Undefined	
28	White/0	Undefined	
29	Brown/7	Existing Irrigation	All drawing information required to describe existing irrigation facilities, includes annotation.
30	Red/3	Cut & Fill Data	All drawing data required to describe the top of cut or toe of slope, includes annotation.

LEVEL NO.	COLOR/ NAME & NUMBER	TITLE	DESCRIPTION/CONTENT
31	Orange/6	Existing Right of Way Boundaries	All drawing information required to describe property lines, township lines, section lines, existing Right of Way lines, existing easement lines.
32	Orange/6	New Right of Way Lines and Fences	All drawing information required to describe proposed Right of Way lines, easement lines, rights of entry, controlled access, fences and ESA boundaries and fences – (if too cluttered, then put on undefined level).
33	Orange/6	Right of Way Text	All Text and Annotation that describes new and existing Right of Way on levels 31 and 32.
34	Orange/6	Temporary Water Pollution Control	All drawing information required to describe Temporary Water Pollution Control, includes annotation.
35	Orange/6	Permanent Erosion Control	All drawing information required to describe Permanent Erosion Control, includes annotation.
36	Blue/1	Drainage	All drawing information required to describe drainage facilities to be constructed, including pipes, box culverts, headwalls, manholes, surfaced & unsurfaced ditches, ABM gutters and drains. Also includes irrigation facilities, except those included on Levels 29 or 50.
37	Blue/1	Drainage Annotation	All Annotation that describes drainage facilities.
38	Violet/5	Sanitary Sewer	All drawing information required to describe sanitary sewer facilities to be constructed, including manholes and sewer lines.
39	Violet/5	Sanitary Sewer Annotation	All Annotation that describes sanitary sewer facilities.
40	Yellow/4 (Note 1)	New Utilities	All drawing information required to describe utility relocation work above and below ground, includes annotation. (See Note 1 for chosen Caltrans colors associated with a particular utility).
41	Violet/5	Contour Grading	Proposed grading contours, slope lines, bench lines, includes annotation.
42	White/0	Pavement Elevations	Elevation of pavement, shoulders, curbs, and gutters.
43	Red/3	Pavement Markers and Striping	All drawing information required to describe pavement markers, striping and markings.
44	Red/3	Pavement Markers and Striping Annotation	All annotation that describes pavement markers, striping and markings.
45	Red/3	Signing	All drawing information required to describe sign installations, guide markers, etc., includes annotation.
46	Red/3	Construction Area Signing	All drawing information required to describe Construction Area signing, including tables, details and annotation.
47	White/0 (Note 2)	Electrical	All drawing information required to describe signal and lighting installations.
48	Yellow/4	Electrical Annotation	All annotation that describes signal and lighting installations.

LEVEL NO.	COLOR/ NAME & NUMBER	TITLE	DESCRIPTION/CONTENT
49	Green/2	Planting and Landscaping	All drawing information required to describe highway planting, landscaping, erosion control, etc., includes annotation.
50	Blue/1	New Irrigation	All drawing information required to describe new irrigation facilities for highway planting and landscaping (shown on Level 49), includes annotation. (The construction of other irrigation facilities is to be included on Level 36.)
51	Red/3	Stage 1 Construction and Temporary Traffic Facilities	All drawing information required to describe detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level also accommodates Stage 4, Stage 7, etc., if necessary.
52	Red/3	Stage 1 Construction and Temporary Traffic Facilities Annotation	All annotation that describes detours and sequences of construction. This level also accommodates annotation for Stage 4, Stage 7, etc., if necessary.
53	Red/3	Stage 2 Construction and Temporary Traffic Facilities	All drawing information required to describe detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level also accommodates Stage 5, Stage 8, etc., if necessary.
54	Red/3	Stage 2 Construction and Temporary Traffic Facilities Annotation	All annotation that describes detours and sequences of construction. This level also accommodates annotation for Stage 5, Stage 8, etc., if necessary.
55	Red/3	Stage 3 Construction and Temporary Traffic Facilities	All drawing information required to describe detours, sequences of construction, temporary barriers, temporary drainage requirements, etc. This level also accommodates Stage 6, Stage 9, etc., if necessary.
56	Red/3	Stage 3 Construction and Temporary Traffic Facilities Annotation	All annotation that describes detours and sequences of construction. This level also accommodates annotation for Stage 6, Stage 9, etc., if necessary.
57	White/0	Undefined	
58	White/0	Sound Wall and Retaining Wall	All drawing information required to depict the construction of Sound Walls and Retaining Walls, includes the plan and elevation views.
59	White/0	Sound Wall and Retaining Wall Annotation	All annotation that describes sound walls and retaining walls, includes curve table for layout lines of walls.
60	White/0	Non-geographical Drawing Data	All drawing information that is non-geographical, such as, details, sectional views, cross sections, profiles, quantities and strip maps. Plan sheets that typically place elements on this level include: Title sheet, Typical Cross Sections, Key Map, Profiles, Superelevation Diagrams, Construction Details and Summary of Quantities.

LEVEL NO.	COLOR/ NAME & NUMBER	TITLE	DESCRIPTION/CONTENT
61	Yellow/4	Headquarter Changes	All final plan revisions performed by HQ Office Engineer after PS&E Submittal and before Advertising and Award.
62	Red/3	As-Built Changes	Changes made during construction that need to be shown on the signed original plans. Revisions are depicted by lining out the original information (do not obscure) and placing the new information.
63	White/0 & Red/3 (Note 3)	Engineer Seal and Signature	Project Engineer signature and seal information. Identification stamps for electronic contract plans and electronic as-built plans.

C. Exceptions or flexibility from the Caltrans Standard Leveling Convention

The Caltrans Standard Leveling Convention should not be changed. However, there are times when an exception (or some flexibility) may expedite the handling of a project to achieve the desired intent. Utilizing the undefined levels will handle most of the situations not defined by the standard leveling convention. When using undefined levels, communicate to others what was done in order to eliminate the loss of efficiency and productivity.

Example: Existing utilities belong on level 5, color orange/6. Level 5 is a dropout level, which changes the weight of the lines representing the utilities to a zero weight and changes the solid line to a dotted line. In the past, some Contractors and Resident Engineers could not clearly see the utility line depicted on the Contract Plans, thus creating confusion and a possible source of conflict.

One way to handle the situation is to move the utility information to an undefined level (which does not dropout). Thus the lines representing the utilities will be more visible on the Contract Plans. If the existing utilities are placed on a non-dropout level, 2 features/attributes have been added to help distinguish existing from proposed. The symbology for existing utilities will have a lowercase letter while proposed utilities will have an uppercase letter. Existing utilities will be shown as a thinner line while proposed utilities will be shown as a thicker line. The difference in width is the important point in distinguishing between existing and proposed. The suggested difference in line weight (wt) is **wt = 1** for existing and **wt = 3** for proposed. On a crowded or cluttered plan sheet, another suggestion would be to use line weight **wt = 0** for existing and **wt = 2** for proposed.

Note 1: Colors have been assigned to various utilities for 2 reasons:

1. To easily distinguish between the various utilities when viewing the design files in the monitor.
2. To assist in the future ability to plot utility verification maps in color. The color yellow is not used because it is difficult to see when plotted.

(See cell "AAUTIL" in the Caltrans Metric Cell Library for the assigned colors. Caltrans custom line styles depicting utilities have been defaulted to these assigned colors).

Note 2: Traffic Electrical has only 1 level (level 47) to place design information. To assist the CADD operator in distinguishing between the various electrical components, cells have been created in various colors, grouped by type of electrical components or symbols. The color scheme is listed below.

White =	Notes and Symbols
Yellow =	Lighting
Green =	Signals
Red =	Conduit and Riser
Violet =	Other Electrical Components

Note 3: Level 63 is now reserved for the Engineer's Seal and Signature. The color white/0 is for the license information and Engineer's signature (whenever used). The color red/3 is for the "as-awarded" and "as-built" cells created to be used "in lieu" of the Engineer's signature when the design file (dgn) is used after PS&E.

D. Structures Leveling Convention

1. General Content of Structures Levels is as follows:

Level 1	Control Data
Levels 2 - 8	Pen table drop out code to be used for elements of existing features
Levels 10	Sheet Formats
Level 12	Dimensions
Levels 13, 16 - 19	Bar Reinforcement
Levels 14 & 15	Notes
Levels 20 - 25	Elements made of structural steel
Levels 30 - 35	Elements made of wood
Levels 36 & 37	Contours
Levels 40 - 50	Elements made of concrete
Level 51	Elements made of concrete masonry
Levels 52 & 53	Bridge Data
Levels 54 – 58	Topo, Original Ground & Survey Control
Level 59	Hydrology Data
Level 60	UBC Code
Level 61	Headquarter Changes
Level 62	As-Built Changes
Level 63	Engineer Seal & Signature

2. Summary of Structures Levels is as follows:

Level	Content
1	Control (Includes Center Line, Station Line)
2	Existing Features for structural steel elements
3	Existing Features for wood elements
4	Existing Features for concrete elements
5	Existing Features for concrete masonry elements
6	Existing Features
7	Existing Features
8	Existing Features
9	Reserved for District use
10	Sheet Formats
11	Undefined

Level	Content
12	Dimensioning (Includes dimension lines, witness lines, dimension text, arrow heads & reinforcement leaders)
13	Bar Reinforcement
14	Detailing Information (Includes text, detail notes & titles)
15	Design Notes
16	Bar Reinforcement
17	Bar Reinforcement
18	Bar Reinforcement
19	Bar Reinforcement
20	Structural Steel
21	Structural Steel
22	Structural Steel
23	Structural Steel
24	Structural Steel
25	Structural Steel
26	Undefined
27	Undefined
28	Undefined
29	Undefined
30	Wood
31	Wood
32	Wood
33	Wood
34	Wood
35	Wood
36	Minor Contours
37	Major Contours
38	Undefined
39	Undefined
40	Concrete
41	Concrete
42	Concrete
43	Concrete
44	Concrete
45	Concrete
46	Concrete
47	Concrete
48	Concrete
49	Concrete
50	Concrete
51	Concrete (Masonry)

Level	Content
52	Bridge Data
53	Bridge
54	Topo Data
55	Topo
56	Topo Data for Contours
57	Original Ground, batch plotting points
58	Survey Control Data
59	Hydrology Data
60	UBC Code
61	Headquarter Changes
62	As-Built Changes
63	Engineer Seal & Signature

3. The following table identifies each level, it's associated color and the specific information belonging on each level for a Structures project.

LEVEL NO.	COLOR NAME AND NUMBER	TITLE	DESCRIPTION/CONTENT
1	Blue/1	Control	Control information (e.g. center line, station line)
2	Purple/2	Existing	Drop out, existing structural steel elements
3	Green/3	Existing	Drop out, existing wood elements
4	Orange/4	Existing	Drop out, existing concrete elements
5	Light Slate Blue/5	Existing	Drop out, existing concrete masonry elements
6	Med Spring Green/6	Existing	Drop out, existing features
7	Pink/7	Existing	Drop out, existing features
8	Cyan/8	Existing	Drop out, existing features
9	Undefined		Drop out, reserved for District Use
10	White/10	Sheet Formats	Standard Sheet with border, trim lines, registration seal, signature blocks, District-County-Kilometer Post, etc.
11	Undefined		
12	Green/12	Dimensioning	Dimension lines, witness lines, dimension text, arrow heads & reinforcement leaders
13	Red/13	Bar Reinforcement	Bar Reinforcement Symbols (excluding reinforcing text)
14	Yellow/14	Detailing Information	Text, detail notes and titles
15	Thistle/15	Design Notes	Design Notes
16	Hot Pink/16	Bar Reinforcement	Bar Reinforcement Symbols
17	Cyan/17	Bar Reinforcement	Bar Reinforcement Symbols
18	Honeydew/18	Bar Reinforcement	Bar Reinforcement Symbols
19	Light Blue/19	Bar Reinforcement	Bar Reinforcement Symbols

LEVEL NO.	COLOR NAME AND NUMBER	TITLE	DESCRIPTION/CONTENT
20	Aquamarine/20	Structural Steel	Structural Steel (plates, beams & misc. steel)
21	Cornflower Blue/21	Structural Steel	Structural Steel (plates, beams & misc. steel)
22	Orange/22	Structural Steel	Structural Steel (plates, beams & misc. steel)
23	Yellow/23	Structural Steel	Structural Steel (plates, beams & misc. steel)
24	Tan/24	Structural Steel	Structural Steel (plates, beams & misc. steel)
25	Light Gray/25	Structural Steel	Structural Steel (plates, beams & misc. steel)
26	Undefined		
27	Undefined		
28	Undefined		
29	Undefined		
30	Burleywood/30	Wood	Wood
31	Peru/31	Wood	Wood
32	Saddle Brown/32	Wood	Wood
33	Brown/33	Wood	Wood
34	Dark Goldenrod/34	Wood	Wood
35	Chocolate/35	Wood	Wood
36	Coral/36	Contours	Minor Contours
37	Magenta/37	Contours	Major Contours
38	Undefined		
39	Undefined		
40	White/40	Concrete	Concrete
41	Steel Blue/41	Concrete	Concrete
42	Cadet Blue/42	Concrete	Concrete
43	Med Violet Red/43	Concrete	Concrete
44	Lt. Pink/44	Concrete	Concrete
45	Dark Orange/45	Concrete	Concrete
46	Azure/46	Concrete	Concrete
47	Pale Green/47	Concrete	Concrete
48	Dark Sea Green/48	Concrete	Concrete
49	Khaki/49	Concrete	Concrete
50	Light Coral/50	Concrete	Concrete
51	Deep Sky Blue/51	Concrete Masonry	Concrete (Masonry)
52	Salmon/52	Bridge	Bridge Data
53	Dark Khaki/53	Bridge	Bridge
54	Peach Puff/54	Topo	Topo Data
55	Med Sea Green/55	Topo	Topo
56	Firebrick/56	Topo	Topo Data for Contours
57	Dodger Blue/57	Original Ground	Original Ground, Batch Plotting Points (circles)
58	Dark Orange/58	Survey Control	Survey Control Data
59	Pale Turquoise/59	Hydrology	Hydrology Data
60	White/60	UBC Code	UBC code information or level map.
61	Yellow/61	Headquarters Changes	Final plan revisions performed by ESC- OE Drafting Services prior to reproduction.
62	Red/62	As-Built Changes	Changes made during construction. Revisions are shown by lining out the original information and then placing the as-built information.
63	White/63 (Red for Cells)	Engineer Seal & Signature	Project Engineer seal and signature information.

E. Right of Way (R/W) Mapping Products Leveling Convention

The R/W Mapping leveling conventions are to be used for R/W Mapping Products only. These are not intended for Final Design Contract plans. If R/W boundaries & annotation are delivered to Design, the Contract Plans leveling conventions must be adhered to. I.E., Existing R/W, Easement, and Property Boundaries reside on Level 31; New R/W and Easement Boundaries reside on Level 32; and the Text & Annotation describing data on Levels 31 & 32 reside on Level 33.

1. General Content of R/W Mapping Levels is as follows:

Level 1	Control Data
Levels 2 - 8	Basic topographic map data
Levels 9 - 11	Sheet formats
Levels 13 - 18	Alignments
Levels 19 - 27	Parcel Coloring
Levels 28 - 37, 43 - 46 *	R/W Data
Levels 38 - 42 *	Landnet Data
Levels 47 - 49 *	Point data
Levels 50 - 52 *	Project Surveyor Data
Levels 53 & 54 *	Clipping & Plotting Boundaries
Levels 12, 55 - 63 **	Undefined

* Flexibility from the R/W Mapping Leveling Convention. (See Note 1)

** Undefined levels may be used for information that has not been assigned to a specific level. (See Note 2)

2. Summary of R/W Mapping Levels is as follows:

Level	Content
1	Photogrammetric Mapping Control
2	Existing Man-Made Features
3	Existing Roadway Features
4	Existing Vegetation and Natural Features
5	Existing Utilities and Utility Facilities
6	Existing Hydrographic Features
7	Relief Features - Contours
8	Spot Elevations and Contour Annotations
9	Appraisal Map Sheet Information
10	General Sheet Formats
11	Record Map Sheet Information
12 **	Undefined
13	Ramp, Over and Under Crossing Alignment Data
14	Ramp, Over and Under Crossing Annotation
15	Mainline Alignment Data
16	Mainline Alignment Annotation

Level	Content
17	Frontage Road Alignment Data
18	Frontage Road Alignment Annotation
19	Parcel Coloring
20	Parcel Coloring
21	Parcel Coloring
22	Parcel Coloring
23	Parcel Coloring
24	Parcel Coloring
25	Parcel Coloring
26	Parcel Coloring
27	Parcel Coloring
28 *	Existing Easement Boundaries
29 *	Existing Easement Annotation
30 *	Existing R/W Annotation
31 *	Existing R/W Boundaries
32 *	New R/W Boundaries
33 *	New R/W Annotation
34 *	New Easement Boundaries
35 *	New Easement Annotation
36 *	Temporary Easement Boundaries
37 *	Temporary Easement Annotation
38 *	Minor Landnet Boundaries
39 *	Minor Landnet Annotation
40 *	Major Landnet Boundaries
41 *	Major Landnet Annotation
42 *	Political & Municipal Boundaries
43 *	JUA/CCUA/Freeway Lease Boundaries & Annotation
44 *	Relinquishment
45 *	Directors Deed
46 *	Vacation/Abandonment
47 *	Landnet Point Data
48 *	R/W Point Data
49 *	Landnet & R/W Plotted Point Data
50 *	Retracement Data
51 *	Retracement Annotation
52 *	Retracement Comments
53 *	Clip Boundaries
54 *	Plot Boundaries
55 **	Undefined
56 **	Undefined
57 **	Undefined
58 **	Undefined
59 **	Undefined
60 **	Undefined

Level	Content
61 **	Undefined
62 **	Undefined
63 **	Undefined

* Flexibility from the R/W Mapping Leveling Convention. (See Note 1)

** Undefined levels may be used for information that has not been assigned to a specific level. (See Note 2)

3. The following table identifies each level, it's associated level name, and the specific information belonging on each level for R/W Mapping projects. Level names are exactly as identified in MicroStation (including the level number). Note: level naming has a character length restriction.

LEVEL NO.	LEVEL NAME	TITLE	DESCRIPTION/CONTENT
1	Control 1	Control	All photo control data, and topographic map survey information. Also includes district-added control information.
2	Exist ManMade 2	Existing Man-Made Features	All existing man-made features not otherwise included in any other level, includes all buildings.
3	Exist Roadway 3	Existing Roadway Features	Edges of existing surfaced areas accessible to vehicles, bicycles or pedestrians within the Existing Roadway limits. See section 2.4_B_3 (page 2.4-4) for a complete description of this level.
4	Exist Veg/Nat 4	Existing Vegetation and Natural Features	All natural vegetation, existing highway plantings, orchards, vineyards, marshes, and miscellaneous natural features such as rock outcrops, slides, etc.
5	Exist Utilitie 5	Existing Utilities and Utility Features	All existing underground and aboveground utility-type facilities (including signals, power and telephone poles and transmission poles for utility, railroad, highway, street, and private improvements.) All existing drainage structures including culverts and headwalls, excluding substantial structures such as buildings. Also, includes district-added underground utilities.
6	Exist Hydro 6	Existing Hydro-graphic Features	All lakes, rivers, streams, natural channels, swamps, and standing water.
7	Contours 7	Relief Features Contour Lines Only	Contours (lines only) of the original terrain.
8	Spot Elev 8	Spot Elevations and Contour Elevation Annotation	Spot elevations and contour elevation annotation.
9	Appraisal Map 9	Appraisal Map	Data specific to Appraisal Map sheets.
10	Sheet Format 10	Sheet Format	Standard Border Sheets, (22" x 34" when plotted) with trim lines, District-County-Route-Post Mile block, plan sheet name, vestee block, geometry tables, North arrow, details, match lines & joining sheet data. (Information associated with the border).
11	Record Map 11	Record Map	Data specific to Record Map sheets.

LEVEL NO.	LEVEL NAME	TITLE	DESCRIPTION/CONTENT
12 **	Undefined 12	Undefined	(See Note 2)
13	Ramp Align 13	Ramp, Over & Under Crossing Alignment	Ramp, Over Crossing & Under Crossing Alignment(s), includes station line and tick marks.
14	Ramp Anno 14	Ramp, Over & Under Crossing Annotation	Ramp, Over & Under Crossing Annotation, includes Route designation, alignment bearing and station number.
15	Main Align 15	Mainline Alignment	Mainline Alignment(s) for the main roadways, includes station line and tick marks.
16	Main Anno 16	Mainline Alignment Annotation	Mainline Alignment Annotation, includes Route designation, alignment bearing and station number.
17	Front Align 17	Frontage Road Alignment	Frontage Road Alignment(s), includes station line and tick marks.
18	Front Anno 18	Frontage Road Alignment Annotation	Frontage Road Annotation, includes Route designation, alignment bearing and station number.
19	Parcel Color 19	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
20	Parcel Color 20	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
21	Parcel Color 21	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
22	Parcel Color 22	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
23	Parcel Color 23	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
24	Parcel Color 24	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
25	Parcel Color 25	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)

LEVEL NO.	LEVEL NAME	TITLE	DESCRIPTION/CONTENT
26	Parcel Color 26	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
27	Parcel Color 27	Parcel Coloring	Parcel Coloring line work and fill for Fee, Easement, and Remainder areas. Specific colors associated with parcel coloring (See Note 3) Optional reference file usage (See Note 4)
28 *	Exist Ease L 28	Existing Easement Boundaries	Existing Easement line work including easements, public roadway alignments, public utilities, and other title encumbrances.
29 *	Exist Ease A 29	Existing Easement Annotation	All Annotation that describes Existing Easements.
30 *	Exist R/W A 30	Existing R/W Annotation	All Annotation that describes Existing & previously existing Rights of Way.
31 *	Exist R/W L 31	Existing R/W Boundaries	Existing & previously existing R/W line work.
32 *	New R/W L 32	New R/W Boundaries	New R/W line work.
33 *	New R/W A 33	New R/W Annotation	All Annotation that describes New Rights of Way.
34 *	New Ease L 34	New Easement Boundaries	New Easement line work – excluding temporary easements.
35 *	New Ease A 35	New Easement Annotation	All Annotation that describes New Easement Annotation.
36 *	Temp Ease L 36	Temporary Easement Boundaries	New Temporary Easements Line work – Construction, Drainage, General, & Slope.
37 *	Temp Ease A 37	Temporary Easement Annotation	All Annotation that describes New Temporary Easements.
38 *	Minor Land L 38	Minor Landnet Boundaries	Minor Landnet Line work – Parcel ownership, Lots, Subsection Lines (1/16 & below), USPLS Gov't Lots.
39 *	Minor Land A 39	Minor Landnet Annotation	All Annotation that describes Minor Landnet.
40 *	Major Land L 40	Major Landnet Boundaries	Major Landnet Line work – Township & Range Lines, Ranchos, Section & ¼ Section Lines, USPLS Gov't Tracts, Subdivision Boundaries.
41 *	Major Land A 41	Major Landnet Annotation	All Annotation that describes Major Landnet.
42 *	PBndy/FedPart 42	Political & Municipal Boundaries	All drawing information required to describe Political Boundaries, City & County limits, Municipal boundaries, Federal Boundaries, and Federal Participation, includes annotation.
43 *	JUA/CCUA 43	JUA/CCUA & Freeway Lease Areas	All drawing information required to describe JUA & CCUA, Freeway Lease Area, and Supplemental Reference Areas, includes annotation.
44 *	Relinquishmt 44	Relinquishment	All drawing information required to identify areas of Relinquishment, includes annotation.

LEVEL NO.	LEVEL NAME	TITLE	DESCRIPTION/CONTENT
45 *	DirectorsDeed 45	Directors Deed	All drawing information required to identify areas in Directors Deeds, includes annotation.
46 *	Vac/Abandon 46	Vacation / Abandonment	All drawing information required to identify areas of Vacation/Abandonment, includes annotation.
47 *	LandnetPts-NP 47	Landnet Point Data	Non-plotted Point data – Landnet Point data that will not be shown on R/W maps including name, description, coordinates, leaders, and cells.
48 *	R/W Pts - NP 48	R/W Point Data	Non-plotted Point data – R/W Point data that will not be shown on R/W maps including name, description, coordinates, leaders, and cells.
49 *	Points-Plot 49	Plotted Point Data	Plotted Point data - Landnet & R/W Point data to be displayed on R/W maps including name, description, coordinates, leaders, and cells.
50 *	Retracement L 50	Retracement Data	Project Surveyors Retracement Line work.
51 *	Retracement A 51	Retracement Annotation	Project Surveyors Retracement Annotation.
52 *	Retracement C 52	Retracement Comments	Project Surveyors Retracement Comments.
53 *	Clip Boundary 53	Clip Boundaries	Reference file clip boundaries and clip masks.
54 *	Plot Boundary 54	Plot Boundaries	Boundary along sheet border used for fenceless IPLOT.
55 **	Undefined 55	Undefined	(See Note 2)
56 **	Undefined 56	Undefined	(See Note 2)
57 **	Undefined 57	Undefined	(See Note 2)
58 **	Undefined 58	Undefined	(See Note 2)
59 **	Undefined 59	Undefined	(See Note 2)
60 **	Undefined 60	Undefined	(See Note 2)
61 **	Undefined 61	Undefined	(See Note 2)
62 **	Undefined 62	Undefined	(See Note 2)
63 **	Undefined 63	Undefined	(See Note 2)

* Flexibility from the R/W Mapping Leveling Convention. (See Note 1)

** Undefined levels may be used for information that has not been assigned to a specific level. (See Note 2)

4. Exceptions or flexibility from the R/W Mapping Leveling Convention

Note 1: The R/W Mapping Standard Leveling Conventions were developed to provide users with a means of grouping similar data types while also separating line work from text. Many of the levels were assigned as a convenience for those users who desire to work across more levels. Not all of the data needs to be separated on all of the defined levels. However, some of the R/W Mapping Standard Leveling Conventions should not be deviated from.

The following table identifies those R/W Mapping Level Conventions that **must** be adhered to:

Level 1	Control Data as described in Sections E 2 & 3
Levels 2 - 8	Basic topographic map data as described in Sections E 2 & 3
Levels 9 - 11	Sheet formats as described in Sections E 2 & 3
Levels 13 – 18	Alignments as described in Sections E 2 & 3
Levels 19 – 27	Parcel Coloring as described in Sections E 2 & 3
Level 31	Existing R/W, Easement, and Property Line Boundaries
Level 32	New R/W and Easement Boundaries
Level 33	All Text & Annotation describing data on Levels 31 & 32
Level 38	All Landnet Boundaries
Level 39	Text & Annotation describing all Landnet
Level 47	All non-plotted Point Data
Level 49	All plotted Point Data

Note 2: There are times when an exception (or some flexibility) may expedite the handling of a project to achieve the desired intent. Utilizing the undefined levels will handle most of the situations not defined by the standard leveling convention. When using undefined levels, communicate to others what was done in order to eliminate the loss of efficiency and productivity.

Note 3: Specific colors in the Caltrans color table (Ctcolor.tbl), 224 & 226 – 231, have been designed and **must** be used for the parcel coloring. These colors were chosen because the Easement & Remainder colored lines are clearly visible while the filled Fee areas do not obscure the overlying topography and data. These colors should also provide enough variation to allow colorblind users of the maps to be able to distinguish between adjoining parcels.

Note 4: The user may work with a separate referenced DGN file for the Parcel Coloring. If this is the case, every level (1 – 63) may be used in this “Parcel Coloring” DGN file.

It is recommended that the coloring for each parcel reside on a separate level. In order to communicate to others the identity of each level, it is recommended that the levels be named. The level names are retained within the “Parcel Coloring” DGN file so every user of this file can access this information when necessary.

For example, if the coloring for Parcel 12345, owned by the Smith’s, is on level 1 then the Level Name could be “P12345” and the Comment could be “Smith”.